User Manual for the CR:260A Series of Sound Level Meters

Cirrus Research plc
dedicated to noise measurement

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Produced by Cirrus Research plc, Acoustic House, Bridlington Road, Hunmanby, North Yorkshire, YO14 0PH, United Kingdom.

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Preface

Thank you for purchasing the CR:260A Series Sound Level Meter. These instruments have been designed to be simple to use and to provide the functions and features needed from a modern Sound Level Meter.

This manual describes the procedure that should be followed to set up and operate the CR:260A Sound Level Meters, as well as comprehensive technical information, information on optional and a troubleshooting guide.

If you are a new user of Sound Level Meters or new to the CR:260A Series Sound Level Meters, first read Section 1 Introduction to familiarise yourself with the features, components and accessories supplied. Then read Section 2 Getting Started for step-by-step instructions on how to use the instrument.

The different versions of the CR:260A Series are:

CR:261A	Class 1 Broadband Only
CR:262A	Class 2 Broadband Only
CR:263A	Class 1 Broadband with 1:1 Octave Band Filters
CR:264A	Class 2 Broadband with 1:1 Octave Band Filters

The CR:260A Sound Level Meters meet the requirements for Class 1 and Class 2 of IEC 61672-1:2002 standard for Class 1 Group X or Class 2 Group X Sound Level Meters as appropriate.

They also meet the requirements for Class 1 and Class 2 according to IEC 60651 and 60804 depending upon the version of the instrument. Please refer to page 42 for full technical details of the CR:260A Sound Level Meters.

To meet the requirements of ANSI S1.4 for Random Incidence microphone response, an NK:70 Random Incidence Adaptor should be used when making measurements. Please refer to page 18 for details of the use of the NK:70 Random Incidence Adaptor.

Messages and Symbols

Messages are used in this manual to bring important information to your attention. The different message classes are indicated as shown below.

Please read. A note is a hint or advice that helps you make best use of the equipment and accessories.

This feature is available only from the ***+Version*** instruments which have been unlocked. This feature is **not** provided by the standard instruments.

Pay attention! A caution informs you that improper use of the equipment or failure to follow instructions may cause data loss or may damage the equipment.

Section 1 Introduction

Main Features

Measurement Functions

The measurement functions that can be provided by the CR:260A Series depend upon the version of the instrument and if the instrument has been upgraded to the ***+Version*** further parameters will be available.

Listed below is a summary of the measurements that can be provided by the basic Broadband instrument and by the addition of the 1:1 Octave Band filters.

Broadband Measurement Mode

In Broadband Mode, the instrument stores the overall values such as L_{Aeq}, L_{AFmax} and L_n's as well as storing a noise profile, or Time History, during each measurement. The frequency weighting used can be selected from either dB(A) or dB(C) by choosing the appropriate measurement mode. (See page 23).

Standard Instruments

The standard version of the CR:260A Series instruments can only store a single measurement.

When the instrument is switched on, the display shows the last measurement. When a new measurement is started, this previous measurement is deleted and replaced by the new measurement information.

The following information is measured by a Standard instrument in Broadband Mode:

Function	Frequency Weighting	Displayed as	Maximum value	Minimum value
Sound Level with Fast Time Weighting	A or C	L_{AF} or L_{CF}	L_{AFmax} or L_{CFmax}	L_{AFmin} or L_{CFmin}
Equivalent Continuous Sound Pressure Level with integration time t	A or C	L_{Aeqt} or L_{Ceqt}	-	-
Sound Exposure Level (SEL)	A or C	L_{AE} or L_{CE}	-	-
Peak Sound Pressure	C	L_{Cpeak}	-	-

+*Version* Instruments

The ***+Version*** of the CR:260A instruments can store up to 100 Measurements which can be of any length, up to a maximum of 99 hours per measurement.

With each measurement is stored a noise profile which consists of 1 second Leq samples, with up to a maximum of 24 hours of Noise Profile being available. Please refer to the Specifications on page 42 for full details of the available memory.

Function	Frequency Weighting	Displayed as	Maximum value	Minimum value
Sound Level with Fast Time Weighting	**A**	**L_{AF}**	**L_{AFmax}**	**L_{AFmin}**
	C	L_{CF}	L_{CFmax}	L_{CFmin}
	Z	L_{ZF}	L_{ZFmax}	L_{Zfmin}
Sound Level with Slow Time Weighting	A	L_{AS}	L_{ASmax}	L_{ASmin}
	C	L_{CS}	L_{CSmax}	L_{CSmin}
	Z	L_{ZS}	L_{ZSmax}	L_{Zsmin}
Sound Level with Impulse Time Weighting	A	L_{AI}	L_{AImax}	L_{AImin}
	C	L_{CI}	L_{CImax}	L_{CImin}
	Z	L_{ZI}	L_{ZImax}	L_{ZImin}
Equivalent Continuous Sound Pressure Level with integration time t	**A**	**L_{Aeqt}**	**-**	**-**
	C	L_{Ceqt}	-	-
	Z	L_{Zeqt}	-	-
Sound Exposure Level (SEL)	A	L_{AE}	-	-
	C	L_{CE}	-	-
	Z	L_{ZE}	-	-
Peak Sound Pressure	**C**	**L_{Cpeak}**	**-**	**-**
Takt Maximum Sound Level DIN 45641 (L_{AFTeq})	A	L_{AFTeq}	-	-
Impulse Weighted Equivalent Sound Pressure Level with integration time t (L_{Ieqt})	A	L_{AIeqt}	-	-
	C	L_{CIeqt}	-	-
	Z	L_{ZIeqt}	-	-

Please note that the items highlighted in **bold** above are the default measurement functions and can be selected from the keypad using the Mode button. All of the other configurations must be accessed via the Deaf Defier 3 software.

1:1 Octave Band Measurement Mode (CR:263A & CR:264A)

In the 1:1 Octave Band Filter Mode, the CR:260A instrument provides a repeating, sequential sweep through the filter bands. In addition to the frequency bands, the instruments also provide a measurement of the overall L_{Aeq}, L_{Ceq} and L_{Zeq} functions.

Standard Instruments

Function	Frequency Weighting	Displayed as	Stored Measurement	Applies to
Sound Level with Fast Time Weighting	Z	L_{ZF}	No	1:1 Octave Bands
Equivalent Continuous Sound Pressure Level with integration time t	Z	L_{Zeqt}	1	1:1 Octave Bands
	A	L_{Aeqt}	1	Broadband
	C	L_{Ceqt}	1	Broadband
	Z	L_{Zeqt}	1	Broadband

+*Version* Instruments

Function	Frequency Weighting	Displayed as	Stored Measurement	Applies to
Sound Level with Fast Time Weighting	Z	L_{ZF}	No	1:1 Octave Bands
Equivalent Continuous Sound Pressure Level with integration time t	Z	L_{Zeqt}	Yes	1:1 Octave Bands
	A	L_{Aeqt}	Yes	Broadband
	C	L_{Ceqt}	Yes	Broadband
	Z	L_{Zeqt}	Yes	Broadband

The 1:1 Octave Band Filters cover the following frequency bands:

31.5Hz, 63Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz, 8kHz, 16kHz

Options & Accessories

A range of options and accessories are available for the CR:260A Series which can enhance the performance of your instrument. For full details, please contact Cirrus Research plc or your local representative.

The most commonly used accessories are listed below.

CR:514	Class 2 Acoustic Calibrator
CR:515	Class 1 Acoustic Calibrator
UA:237	Windshield
CK:250	Carrying Case
CP:65	Carrying Pouch for Sound Level Meter (CR:261A & CR:263A Only)
CT:1	Tripod
CM:270/1	Preamplifier Tripod Mount
ZL:202	2m Microphone Extension Cable
ZL:205	5m Microphone Extension Cable
ZL:210	10m Microphone Extension Cable
ZL:225	25m Microphone Extension Cable
ZL:100	USB Data Cable
SW:DD3	Deaf Defier3 Software

Section 2 Getting Started

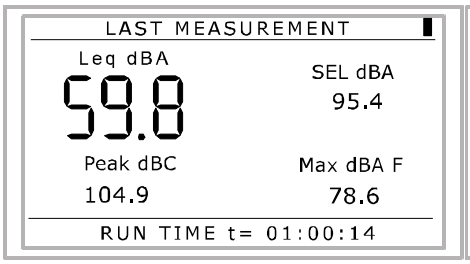
Quick Start

1. Switch On

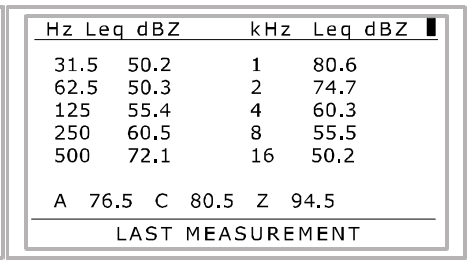
Press the Power button to switch on the Sound Level Meter

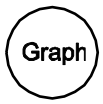
The instrument will display the startup screen, and then will display the last measurement made.

Broadband Mode

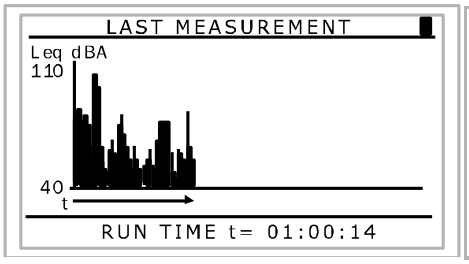


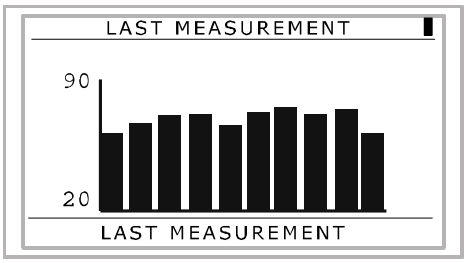
1:1 Octave Band Mode
CR:264A & CR:263A Only





Press the Graph Key to cycle between the numerical display and the graphical display of the last measurement.

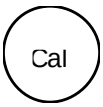




2. Calibration

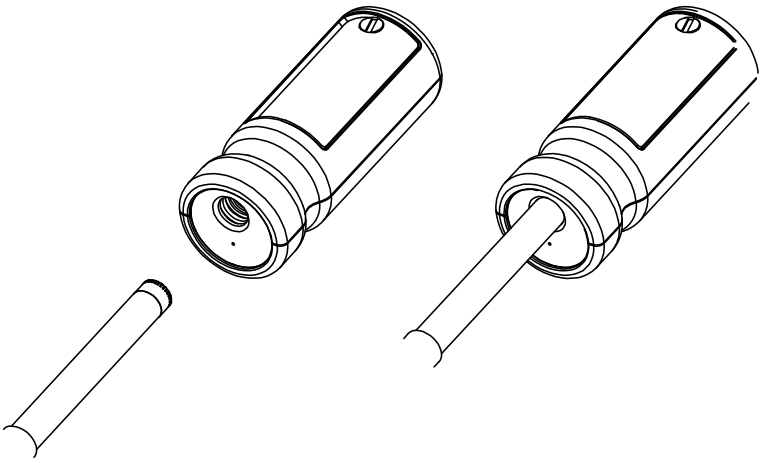
Attach the Acoustic Calibrator to the Sound Level Meter and switch to the 94dB level setting.

Press the Cal key to start the calibration procedure.



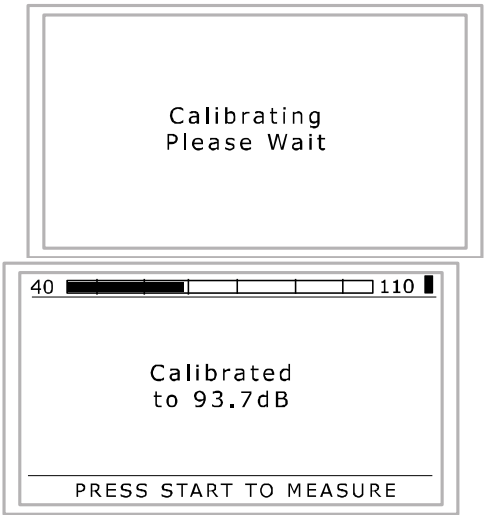
When the calibration is complete, the display will change to show the calibration level.

Remove the Acoustic Calibrator, switch off the calibrator and store.



Attaching the Calibrator

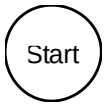
Gently push and twist the calibrator clockwise.



3. Measurement Range

The Sound Level Meter should be set to the correct range before measurements are made.

Press the Start Key.



Use the Up and Down Arrow keys to change the measurement Range.

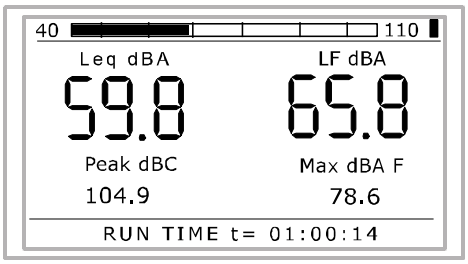
The bar graph at the top of the screen will change to show the selected range and the current noise level.

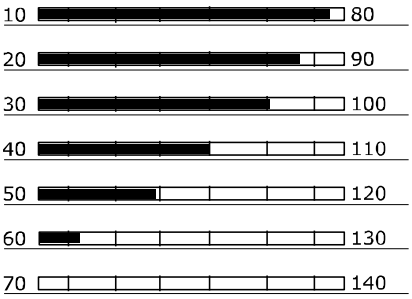
If the selected measurement range is too low, the instrument will display the Overload symbol.

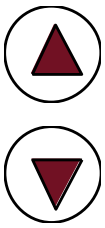
Select a higher measurement range.

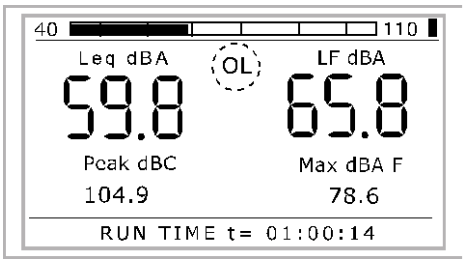
If the selected measurement range is too high, the instrument will display the Under-Range symbol.

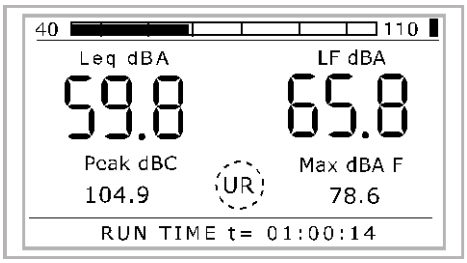
Select a lower measurement range.





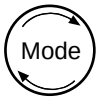






4. Mode Select

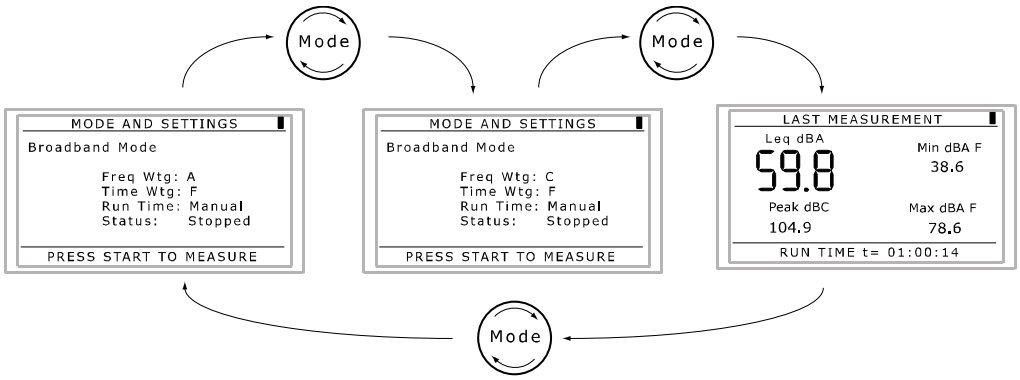
Press the Mode key to view the current setup.



CR:262A & CR:261A Instruments

The CR:262A and CR:261A instruments provide Broadband measurements only.

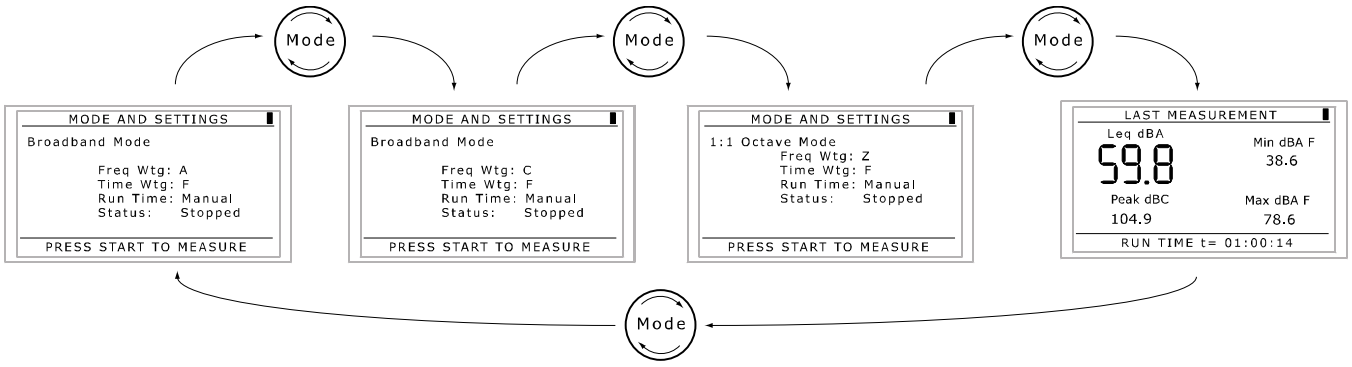
The Frequency Weighting can be selected from either dB(A) or dB(C) by pressing the Mode button.



CR:264A & CR:263A Instruments

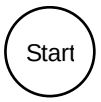
The CR:264A and CR:263A instruments provide Broadband measurements in either dB(A) or dB(C) & 1:1 Octave Band Filter Measurements.

Press the Mode Key to switch between dB(A) and dB(C) Broadband modes or 1:1 Octave Band Mode.

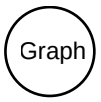


5. Start Measurement

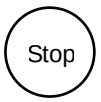
Press the Start button to start a measurement in the current mode.



Press the Graph button to view the graphical display.

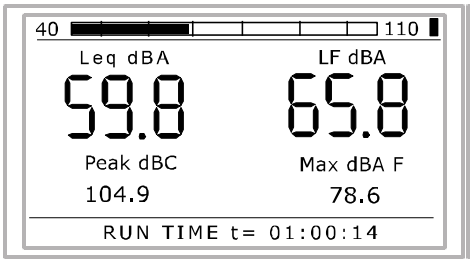


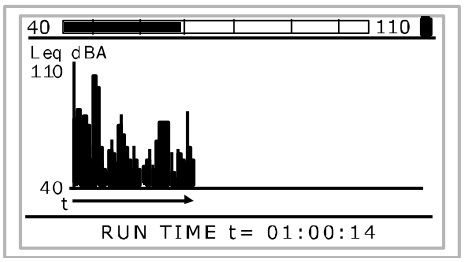
Press the Graph button again to return to the Numerical display.

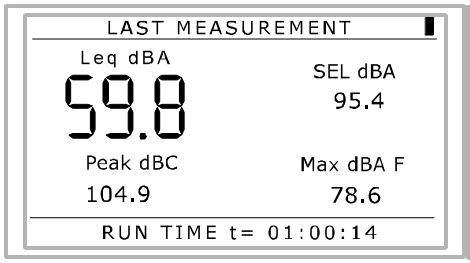


Press the Stop button to finish the measurement. The last measurement will be displayed.

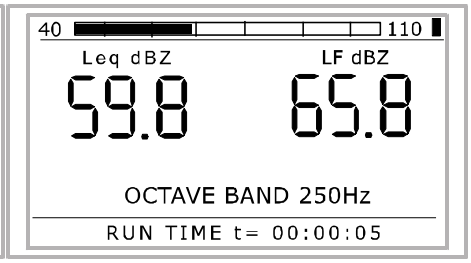
Broadband Mode

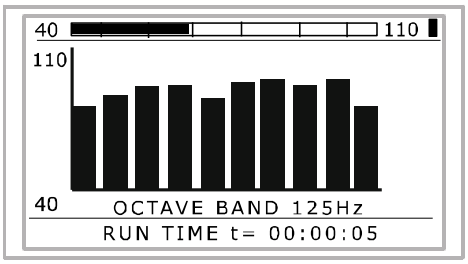


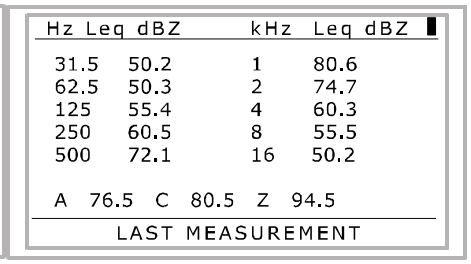




1:1 Octave Band Mode
CR:264A & CR:263A Only





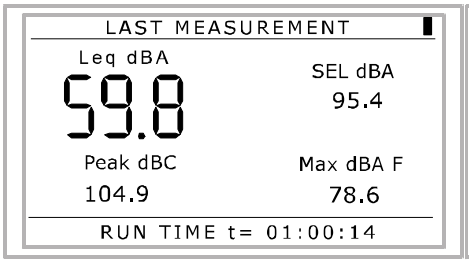


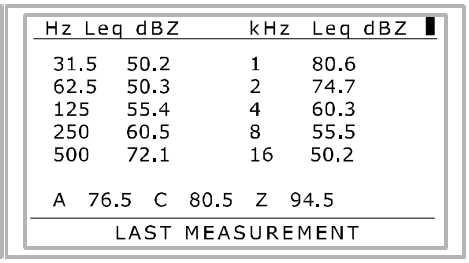
6. Review the measurement

Broadband Mode

1:1 Octave Band Mode
CR:264A & CR:263A Only

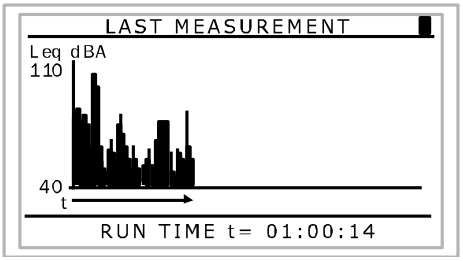
The instrument will display the last measurement made.

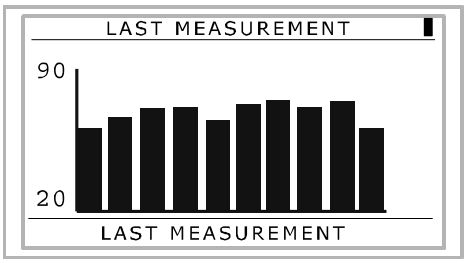




Press the Graph button to view the graphical display.

Graph





Press the Graph button again to view the Numerical display

7. Recording the measurement information

Please note that the standard CR:260A Instrument only stores the last measurement in memory. When a new measurement is made, the last measurement information is erased and overwritten.

Record the measurement information before making a new measurement

To store additional measurements in memory, the instrument must be upgraded to the ***+Version***.

8. Switch off

Press and hold the Power button to switch off the instrument.

Section 3 Using the CR:260A Series Sound Level Meters

Unpacking and checking the Sound Level Meter

Carefully remove the instrument from its shipping container and inspect it for possible damage or missing items. If the meter appears to be damaged or something is missing, contact Cirrus Research plc or your local representative immediately.

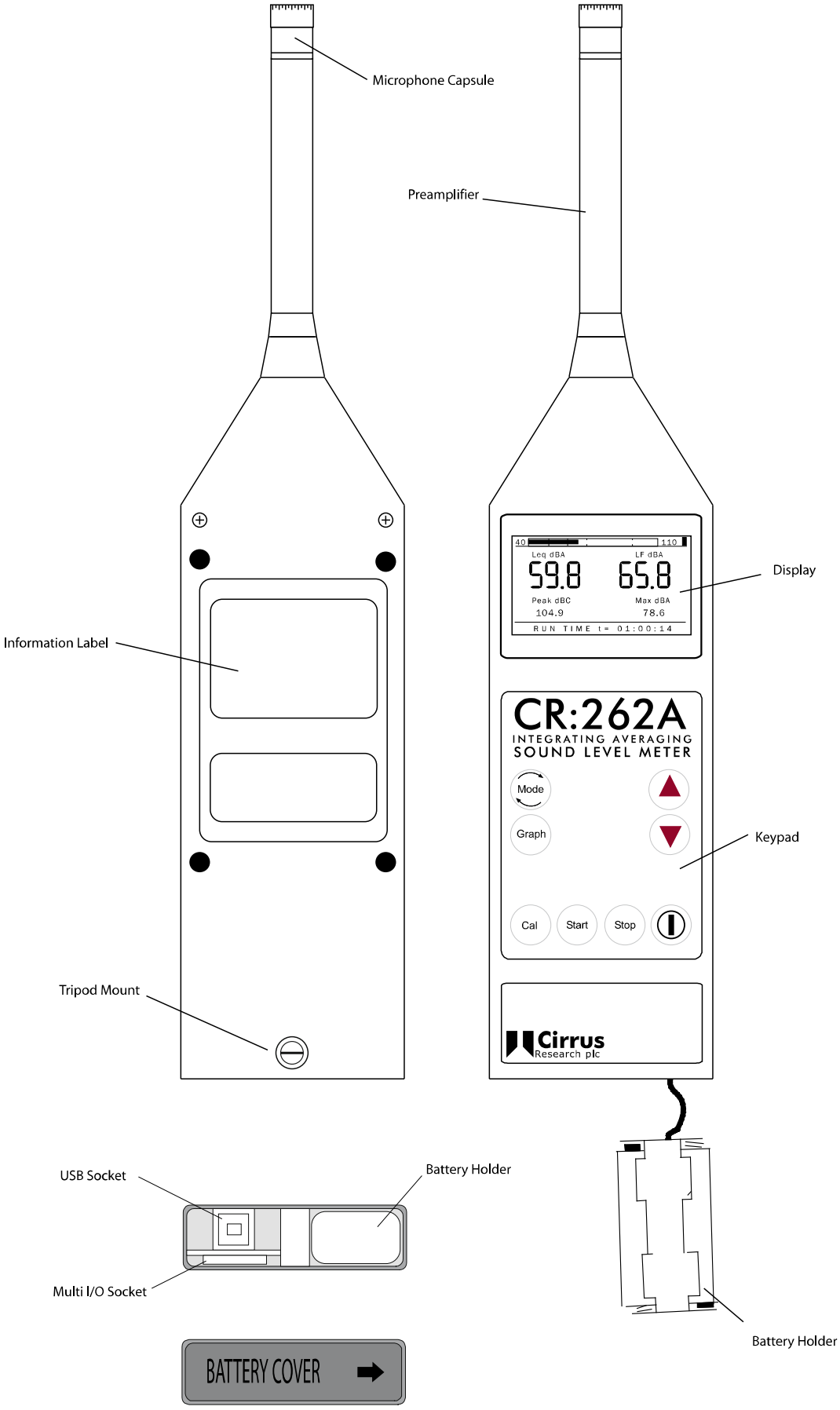
The basic CR:260A Series instrument is supplied with the following standard accessories:

Deaf Defier3 for Windows Software on CD-ROM
CR:260A Series User Manual
ZL:100 USB Data Cable
Batteries 2 x AA
Certificate of Calibration

In addition, the Class 1 versions of the instrument are supplied with an MV:200D Preamplifier and a microphone box. The microphone capsule will be fitted to the MV:200D Preamplifier before shipping.

If you have ordered the instrument as a complete measurement kit, you will also receive an Acoustic Calibrator, Carrying Case, Wriststrap and Pen.

Instrument Layout



Assembly

The CR:260A instruments are supplied fully assembled apart from the removable MV:200D Preamplifier for Class 1 instruments (CR:261A & CR:263A) and the batteries.

Preamplifier

The preamplifier must be connected to the Sound Level Meter ***before*** the unit is switched on. This unit is connected to the top of the instrument using a locking ring. To connect the MV:200D Preamplifier, follow the diagram below:

1. Push the preamplifier into the socket on the Sound Level Meter
2. Ensure the connector has located into the socket
3. Tighten the Locking Ring.

Do not cross thread the locking ring. Damage caused by misuse is not covered by the warranty for the instrument.

Removing the Preamplifier

Do not twist the preamplifier body. Unscrew the locking ring and pull the preamplifier from the Sound Level Meter.

Using Microphone Extension Cables

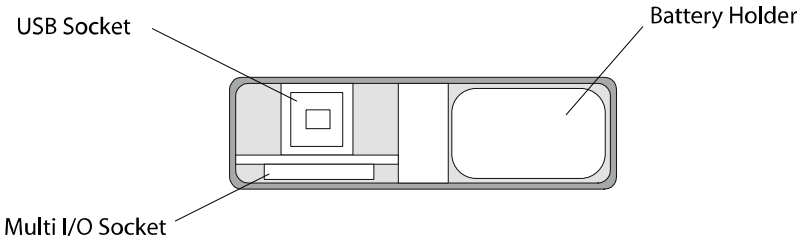
The Class 1 CR:261A & CR:263A instruments can be used with a microphone extension cable. If a microphone extension cable is to be used during a measurement, the instrument must be calibrated with the cable attached.

Connect the microphone extension cable in the same manner as the MV:200D Preamplifier.

Batteries

The batteries of the CR:260A are located behind the cover on the bottom of the instrument. Slide the cover to the right hand side to remove and to access the battery holder.

Ensure the instrument is switched off. Remove the battery holder from the instrument and insert the batteries. The CR:260A instruments uses two AA Class batteries, also known as LR6.



Ensure that the batteries are inserted correctly. ***DO NOT*** reverse the polarity of the batteries as this may cause damage to the instrument.

Windshield

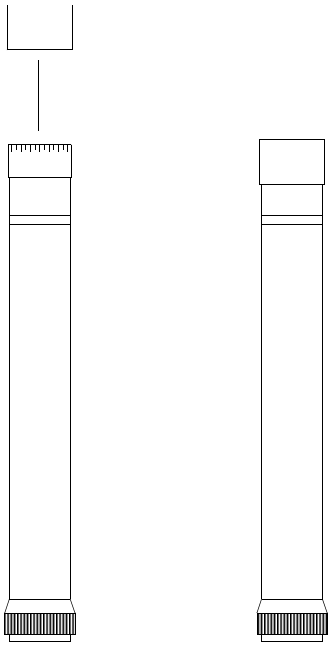
The CR:260A Series can be used with a UA:237 Foam Windshield which will reduce the noise levels generated by air turbulence over the microphone capsule.

The windshield can also be used to protect the microphone capsule of the Sound Level Meter from dust which may affect the performance of the instrument.

To use the UA:237 Windshield, push the hole in the windshield over the microphone of the Sound Level Meter.

The UA:237 Windshield must be removed before the Sound Level Meter can be calibrated.

NK:70 Random Incidence Corrector



The NK:70 Random Incidence Corrector is designed to modify the response of the microphone capsule from Free Field to Random Incidence in order to comply with the requirements of ANSI S1.4.

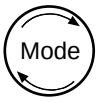
For instruments supplied for use outside of the USA, this adaptor may not be supplied. For further details, please contact your local representative or Cirrus Research plc.

To fit the NK:70 Random Incidence Corrector, push the corrector over the microphone grill. Do not attempt to remove the microphone grill as this may cause damage to the capsule.

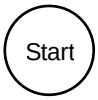
To calibrate the instrument fitted with the microphone capsule, remove the NK:70 Corrector and follow the instructions supplied with the instrument. Do Not attempt to calibrate the instrument with the NK:70 fitted.

Keypad Functions

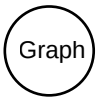
Power
Switch On & Off the Sound Level Meter



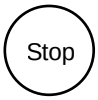
Measurement Mode
Select the measurement mode & view the current measurement mode settings



Start
Starts a new measurement. Resets the current measurement if the instrument is running



Graph
Switches between the Numerical and Graphical displays



Stop
Stops the current measurement

Up
Moves the Measurement Range up. Resets the current measurement if the instrument is running

Down
Moves the Measurement Range down. Resets the current measurement if the instrument is running

Switching On

Press the Power Button to switch on the Sound Level Meter.

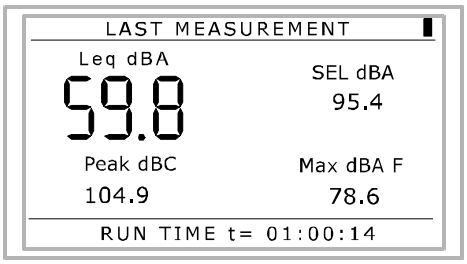
When the instrument is switched on, the Start-up screen will be displayed, and after a short time, the display will change to show the last measurement that was made.

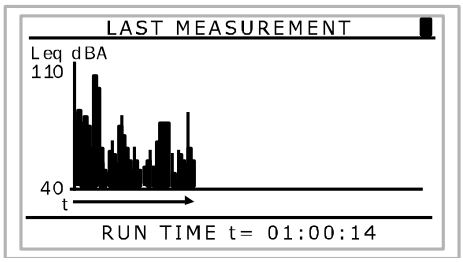
Viewing the last measurement

When the Sound Level Meter is switched on, it will display the last measurement that has been made. If there are no measurements in the memory, the instrument will automatically start a new measurement.

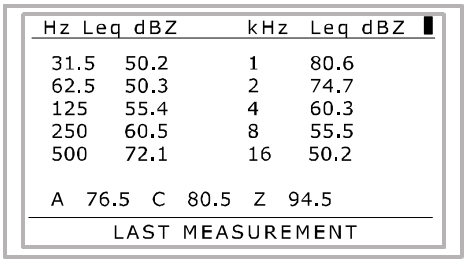
The information that is displayed from the last measurement is shown below.

Broadband Measurement

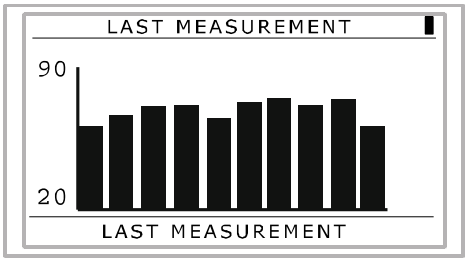




1:1 Octave Band Measurement
CR263A & CR:264A Only



Press the Graph key to switch between the Numerical and Graphical displays



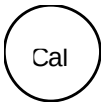
Calibration

If a microphone extension cable is to be used during a measurement, the instrument must be calibrated with the cable attached.

Calibrating the Sound Level Meter

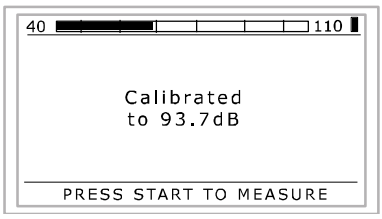
Select the calibration level on the Acoustic Calibrator. For most users, this will be 94dB when using a Cirrus CR:514 or CR:515 Acoustic Calibrator.

Gently push the calibrator onto the microphone capsule, slowly twisting clockwise.



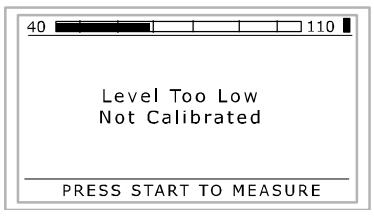
Press the CAL button to start the calibration procedure

During the calibration, the instrument will display the calibration status.

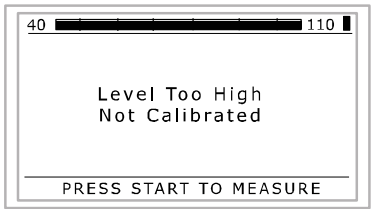


If the calibration is successful, the instrument will display the calibration level. Press the Start button to begin a new measurement or to return to the main screen.

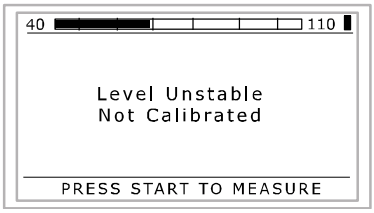
If the calibration is not successful, the instrument will display an error message. These are shown below.



The calibration level is below the set level. Check that the Calibrator is switched on and that it is connected correctly to the Sound Level Meter.



The calibration level is above the set level. Check that the Calibrator is set to the correct level.



The calibration level is unstable. This may be caused by high background noise levels. Move to a quieter location and retry the calibration.

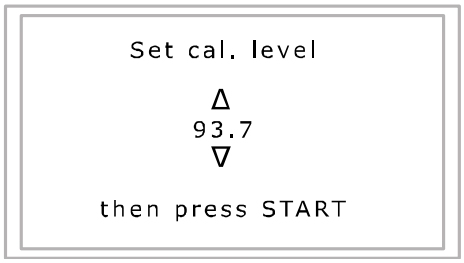
Please note that if the CAL button is pushed when the instrument is running and making a measurement, the current measurement will be stopped and the information discarded. The measurement information will not be stored in the instrument memory.

To Remove the calibrator, gently pull the calibrator whilst twisting the calibrator clockwise. This will help to ensure that the microphone capsule does not become unscrewed from the instrument. For more information refer to Appendix 4 “Acoustic Calibrators”.

Changing the Calibration Level

The calibration level of the Sound Level Meter can be adjusted from the default level of 93.7dB.

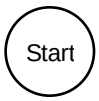
To change the calibration level, press and hold the Cal key for more than 2 seconds.



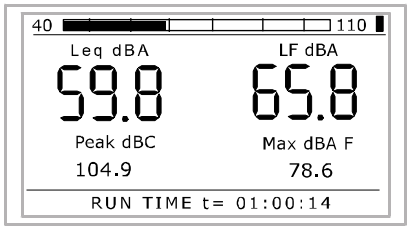
Use the Up and Down arrows to change the level. Press START to accept the new level and to return to the main operation of the Sound Level Meter.

Setting the measurement range

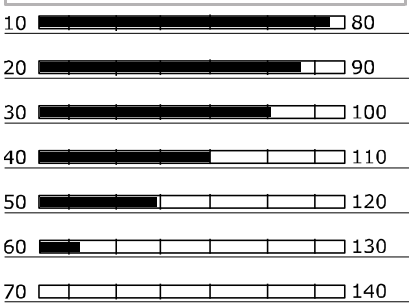
One of the most important features of a Sound Level Meter is the measurement range. If the measurement range is set too high, the instrument may not be able to record low levels. If the measurement range is set too low, high noise levels will overload the instrument and make the measurement invalid. Therefore it is vital that the correct measurement range is chosen for the noise to be recorded.



To set the measurement range, press the Start key. The instrument will start a measurement.

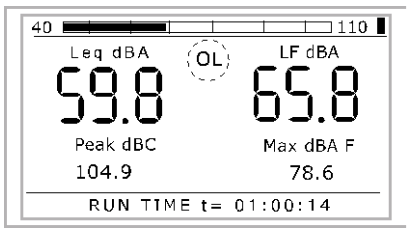


The instrument is running. The measurement range in this example is 40dB to 110dB as shown at the top of the screen.



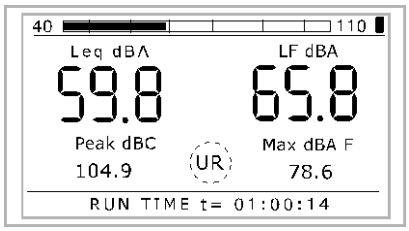
Use the Up and Down keys to change the measurement range. As the range changes, the Top and Bottom of the selected range is shown on the graph.

This example shows a noise level of 68dB on the different measurement ranges. Select a measurement range appropriate for the levels to be measured.



It is very important that a Sound Level Meter is not overloaded when making a measurement. In this example, the range is set to 10-80dB. The noise level is higher than this and so the instrument indicates Overload as **OL**

Change to a higher measurement range.



In this example, the noise level is below the bottom of the selected measurement range.

Select a lower measurement range.

If the range is changed during a measurement, the current measurement will be discarded and a new measurement started.

Setting the measurement mode

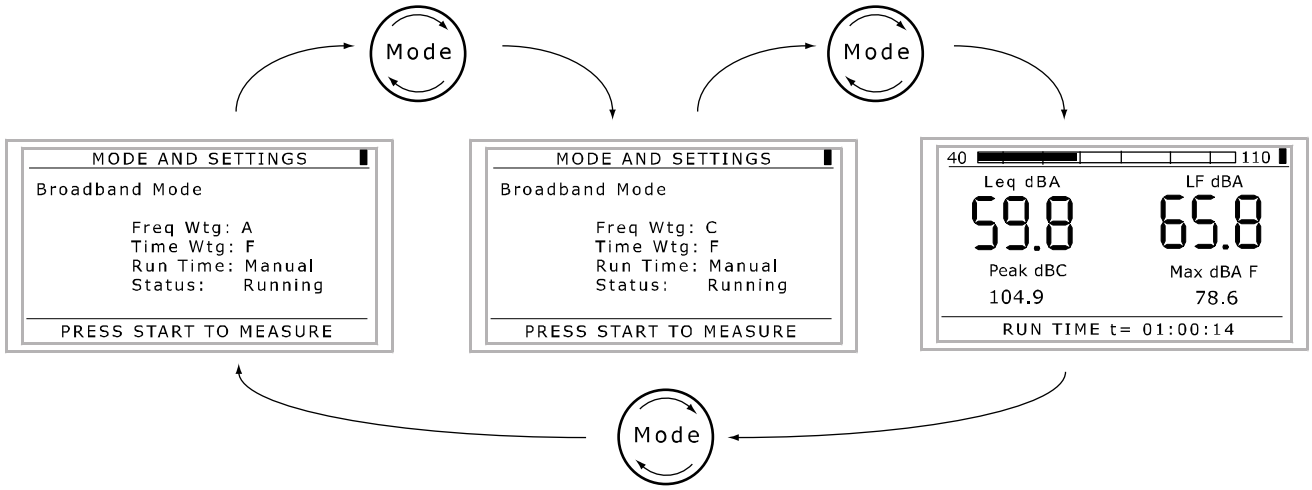
The CR:260A Series Sound Level Meters can make either Broadband Measurements (CR:262A & CR:261A) or 1:1 Octave Band Measurements (CR:264A & CR:263A).

Selecting the measurement mode allows these different measurements to be made.

Broadband Measurements

Press the Mode button to change the Measurement Mode to Broadband Mode. The instrument will display the current settings for the Broadband Mode.

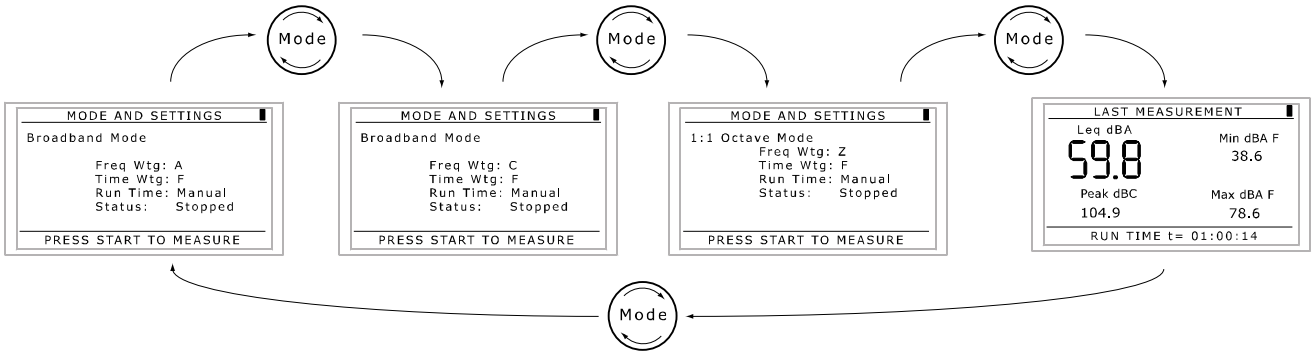
All of the CR:260A Series can measure in either dB(A) or dB(C) when set to the Broadband mode function. Press the Mode button to select the frequency weighting required.



In the CR:262A & CR:261A instruments, pressing the Mode key will cycle between the Mode view and the measurement view. Press Start to begin the measurement.

1:1 Octave Band Measurements (CR:264A & CR:263A Only)

Pressing the Mode key will cycle between the Broadband Modes, 1:1 Octave Mode and the measurement view.



Select the Mode required and press Start to begin the measurement.

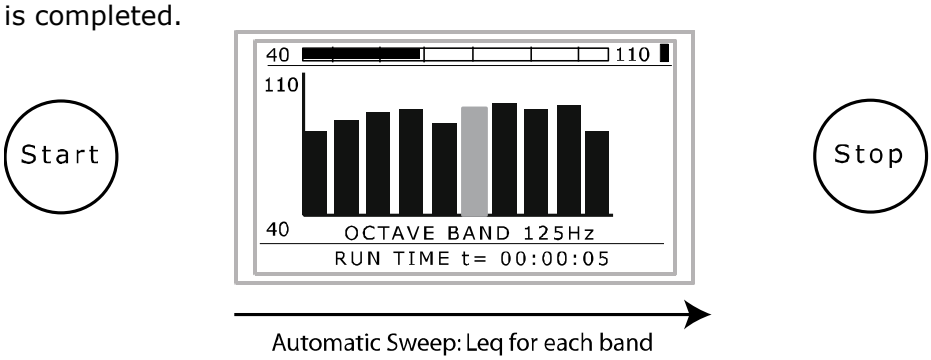
Understanding how 1:1 Octave Band Measurements are made

In the CR:264A and CR:263A instruments are a set of 1:1 Octave Band Filters which allow the instrument to measure the frequency content of noise sources.

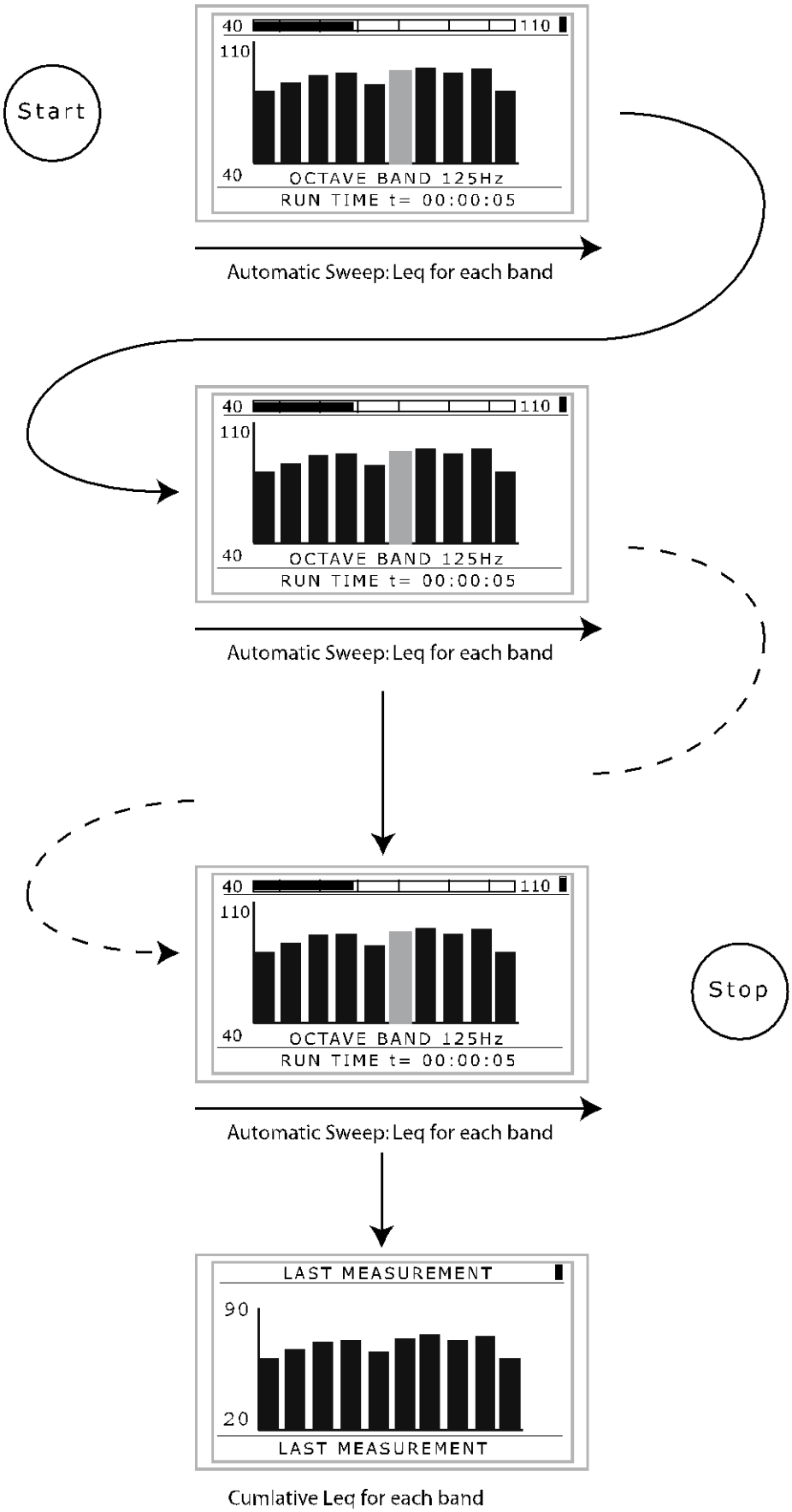
When the 1:1 Octave Band measurement mode is selected, the instrument will automatically sweep through the frequency bands from 31Hz to 16kHz, followed by a dB(A) Leq, a dB(C) Leq and then a dB(Z) Leq measurement. All frequency band measurements are made as Leq measurements and the Octave Band Filters are automatically weighted with the dB(Z) frequency weighting.

This sweep takes 2 seconds per band, with a total of 26 seconds for a complete sweep. When the sweep is completed, the instrument starts the next sweep, with the Leq for each measurement band being added to the previous value. The instrument will continue to make sweeps of the frequency bands until the user presses the Stop key. The figures below show how this works in practice.

Example 1. The user Starts the measurement and Stops the measurement when the dB(Z) Leq is completed.



Example 2. The user Starts the measurement and the instrument runs for a longer period, sweeping through the filter bands more than once.



At the end of the measurement when the user presses Stop, the instrument calculates and displayes the cumulative Leq for each filter band.

Making a measurement

Please read this section very carefully. It contains important information about making and storing measurements with the CR:260A Sound Level Meters

Memory Functions

The ***+Version*** of the CR:260A Series Sound Level Meters can store up to 100 measurements and up to 24 hours of 1 second Short Leq Time History (with Broadband measurements). The Standard versions of the instrument can only store 1 measurement.

Understanding how measurements are stored

The memory of a ***+Version*** of the CR:260A Series can store up to 100 measurements. A measurement can be one of the following Classes:

- Calibration Record
- Broadband Measurement
- 1:1 Octave Band Measurement

The 100 measurements can be a combination of any of these Classes. In addition to the 100 measurements, the instrument also store a Time History, or noise profile, with each Broadband Measurement. Up to 24 hours of 1 second Short Leq Time History can be stored in the memory.

For example, if the instrument makes 24 Broadband measurements of 1 hour duration, each measurement will have Time History data. However, if any more Broadband measurements are made, the Time History memory will be full and no further Time History data will be stored. The instrument will display a message to confirm this. The overall Broadband Measurement parameters will still be stored, but without Time History Data.

Memory nearly full

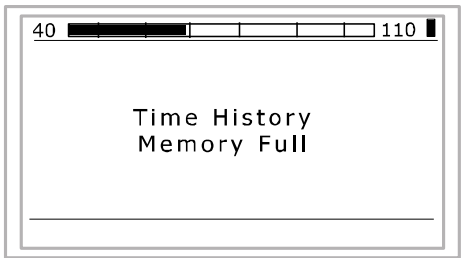
When the memory of the ***+Version*** instrument is nearly full, the instrument will show the following screen:

When this screen is displayed, the instrument can store the following further measurements:

- 5 Broadband Measurements
- 3 1:1 Octave Band Measurements

Time History Memory Full

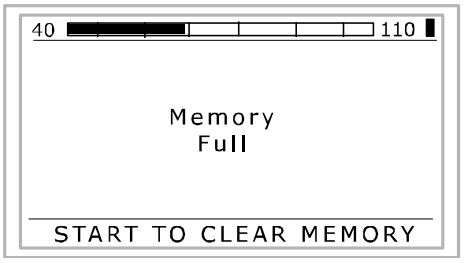
When the 24 hours of Time History memory is full, the instrument will display the following message:



The instrument will continue to measure and store Broadband measurements but no further Time History data will be stored.

Memory Full

The instrument cannot store any more measurements in the memory and those measurements already stored must be downloaded and the memory cleared. The instrument will display the following message:



Press the Start button to clear the memory.

Pressing the Start button will delete all measurements from the instrument memory. Please ensure that all measurements have been downloaded to the Deaf Defier3 software before clearing the instrument memory.

Once measurements have been cleared from the instrument memory, they cannot be retrieved.

Starting the measurement

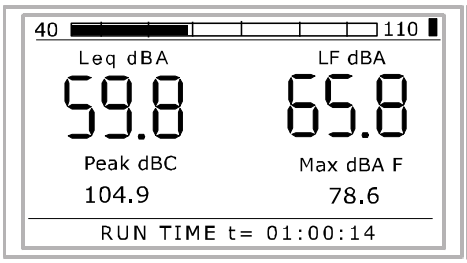
Start

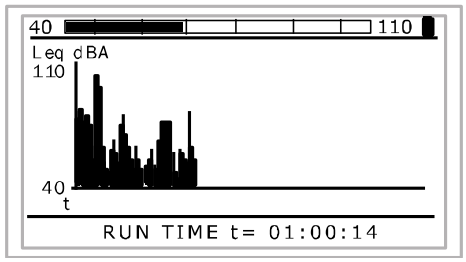
Press the Start button to begin the measurement.

During the measurement, press the Graph key to view the graphical display. Pressing the Graph key will switch between the Numerical and Graphical Displays.

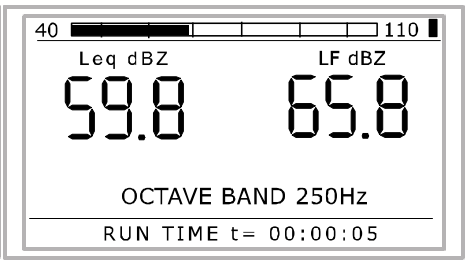
Graph

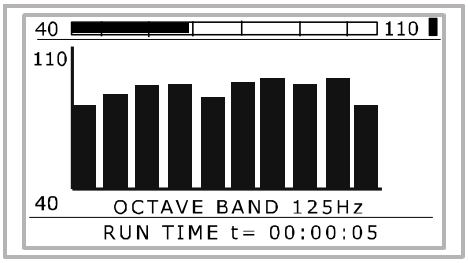
Broadband Mode





1:1 Octave Band Mode
CR:264A & CR:263A Only





The instrument will continue to run until one of the following conditions occur:

- The user presses the Stop button
- The instrument reaches the end of the preset measurement duration (***+Version*** Only)
- The user Resets the current measurement

Resetting the measurement

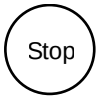
If any of the following keys are pressed during a measurement, the current measurement will be cancelled and the measurement restarted:

Up
The measurement range will be moved up 1 range. The current measurement will be reset and a new measurement started. The current measurement information will be discarded.

Down
The measurement range will be moved down 1 range. The current measurement will be reset and a new measurement started. The current measurement information will be discarded.

Start
Start
Resets the current measurement and starts a new measurement. The current measurement information will be discarded.

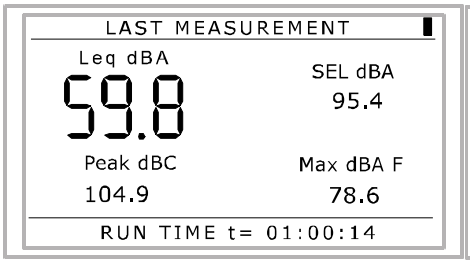
Stopping & reviewing the measurement



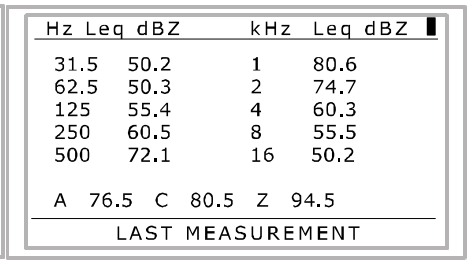
Press the Stop button to finish the measurement.

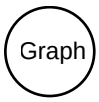
When the measurement is complete, the instrument will display the measurement data for the last measurement.

Broadband Mode

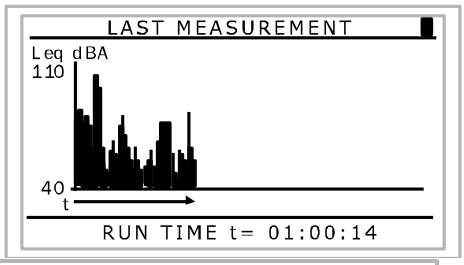


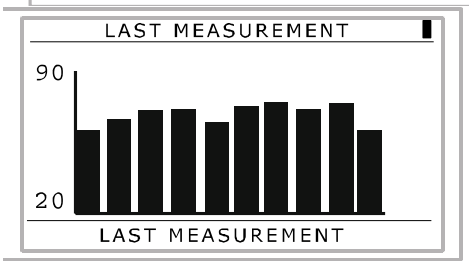
1:1 Octave Band Mode





Press the Graph key to switch between the Numerical and Graphical measurement information.





Please note that if a new measurement is started, the last measurement will be overwritten and the information lost.

Ensure that measurements have been recorded before making a new measurement.

The ***+Version*** of the CR:260A Series can store up to 100 measurements but only the last measurement can be viewed from the instrument. To view previous measurements, connect the instrument to the Deaf Defier3 software and download the measurements.

Switching off the instrument

Press and hold the Power Button to switch off the Sound Level Meter.

Section 4 Additional features of the +*Version* Instruments

Upgrading the CR:260A Series Sound Level Meters to the ***+Version*** adds new functions and features to the performance of the instrument. These new functions are accessed from the Deaf Defier3 Software, which is described below.

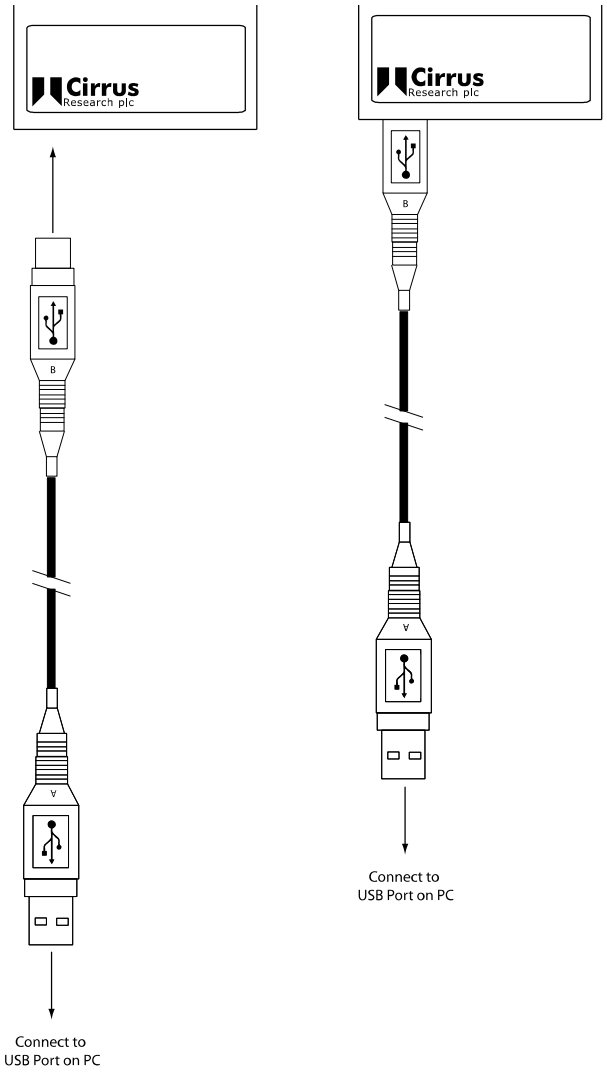
Making measurements

The ***+Version*** of the instruments can store up to 100 measurements. Each measurement is made in the same way as the standard instruments. When each measurement is stopped, it is automatically stored in the instrument memory. When the instrument is connected to the Deaf Defier3 software, the measurements that are stored in the instrument memory can be viewed and downloaded as required.

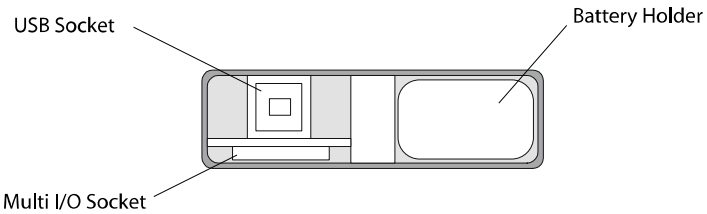
Downloading Measurements to the Software

Before measurements can be downloaded, the software must be installed on to a suitable PC.

Connecting the instrument to the PC



The CR:260A instruments connect to the PC using the supplied ZL:100 USB Cable.



Connect the ZL:100 USB Cable to the USB socket on the bottom of the instrument.

Ensure that the cable is inserted correctly with the arrow on the top of the connector.

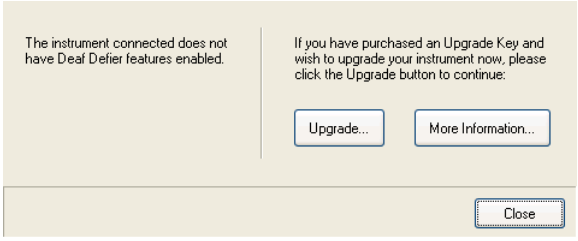
Do not force the connector into the socket as this may cause damage.

When the Deaf Defier3 software is installed and run, use the Download option to connect to the instrument.

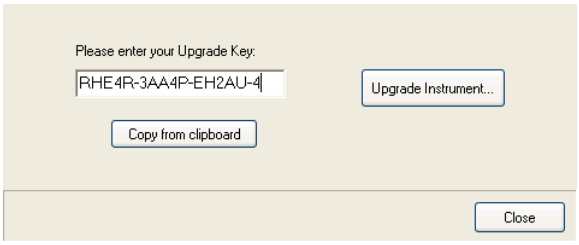
Please refer to the Help provided with the Deaf Defier3 software for details of the download procedure.

Standard Version Instruments

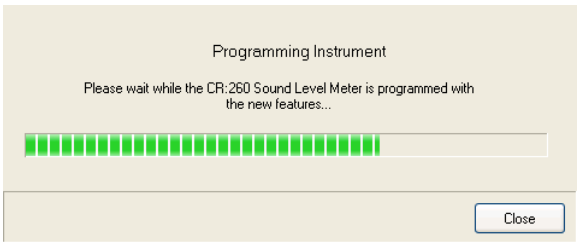
When a standard CR:260A Series Sound Level Meter is connected to the Software, the user will be given the option to enter the unlocking key to upgrade the instrument to the +Version specification. The screen below will be shown:



To upgrade the instrument to the ***+Version*** specifications, press the Upgrade… key and the following screen will be displayed. Enter the Upgrade key and press the Upgrade Instrument button:



The software will program the instrument with the key to unlock the new features. The software will show the following screens during the upgrade process:



If the instrument is not upgraded to the ***+Version*** specification, measurements cannot be downloaded to the Deaf Defier3 software.

For details of upgrading the standard instrument to the ***+Version*** specification, please contact your local representative or Cirrus Research plc.

+Version Instruments

When the Deaf Defier3 software is installed and run, use the Download option to connect to the instrument. The Deaf Defier3 software will automatically detect the CR:260A instrument and allow measurements to be downloaded.

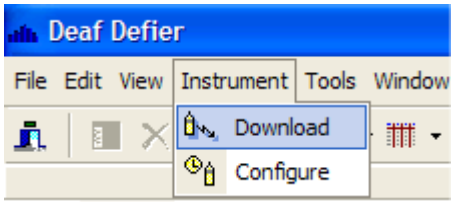
Using the Deaf Defier3 Software

Ensure that the Sound Level Meter is connected to the Software and that it is switched on. If the Sound Level Meter is not switched on, the software will not be able to detect the instrument. The information provided in this manual is a brief summary of the functions available from the Deaf Defier3 software. Please refer to the information provided with the software.

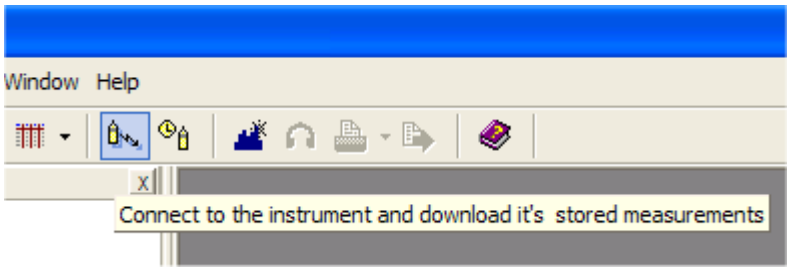
Downloading measurements

To download measurements from the Sound Level Meter to the Deaf Defier3 software, do one of the following:

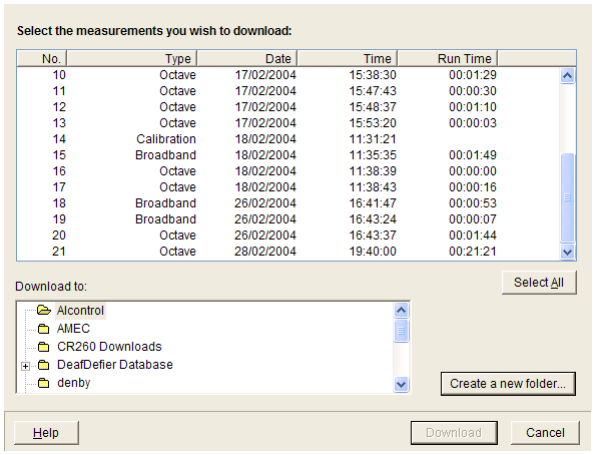
Press the Instrument, Download menu



Click the Download Measurement button:



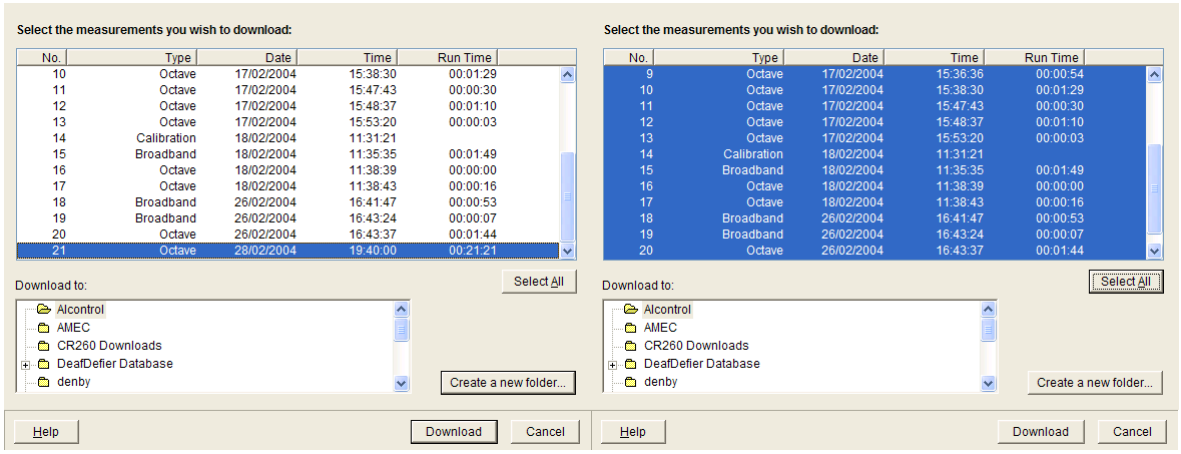
The software will display the measurement catalogue in the instrument, with each measurement identified by the measurement number, type, date, time and measurement duration.



The user can download either selected measurements or all measurements. To select individual measurements, click on the measurement with the mouse. To select multiple measurements, hold the Control key and select the measurements.

To select all of the measurements in the memory, press the **Select All** button and the software will highlight all of the measurements in the memory.

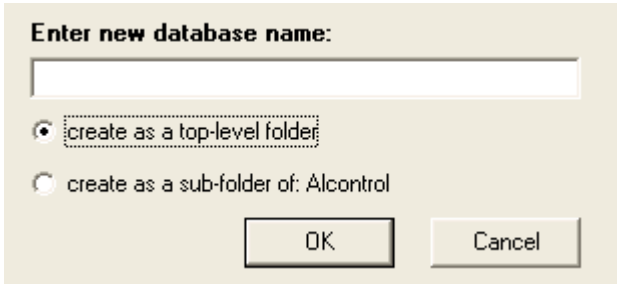
The examples below show a single measurement selected and all of the measurements selected:



To select the location where the measurements will be stored, do one of the following:

Select an existing folder in the folder list

Press the Create a new folder button to make a new download folder



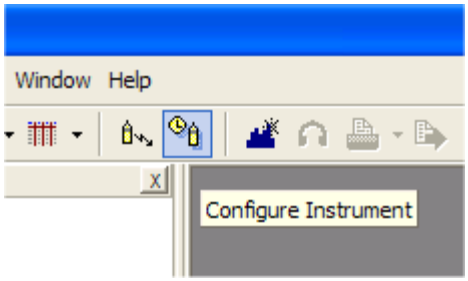
Enter the name for the new folder. Folders can be either a top level folder, ie a main folder, or can be a sub folder from an existing folder. This can be useful for storing measurements made at the same location on different days.

Press OK to select the new folder.

Press the Download button to download the measurements from the instrument to the software. Measurement will be automatically stored in the database for review and reporting. Please refer to the Deaf Defier3 help for further information.

Setting the instrument clock

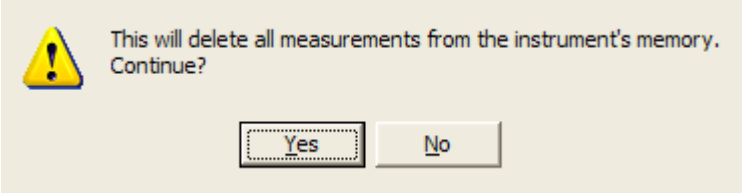
Press the Configure Instrument button:



Press the Set Clock button to set the clock of the Sound Level Meter to the clock in the PC. Please ensure that the clock of the PC is correct.

Clearing the memory

Press the Clear Memory button from the Configure Instrument screen. The software will request confirmation that the memory is to be cleared.

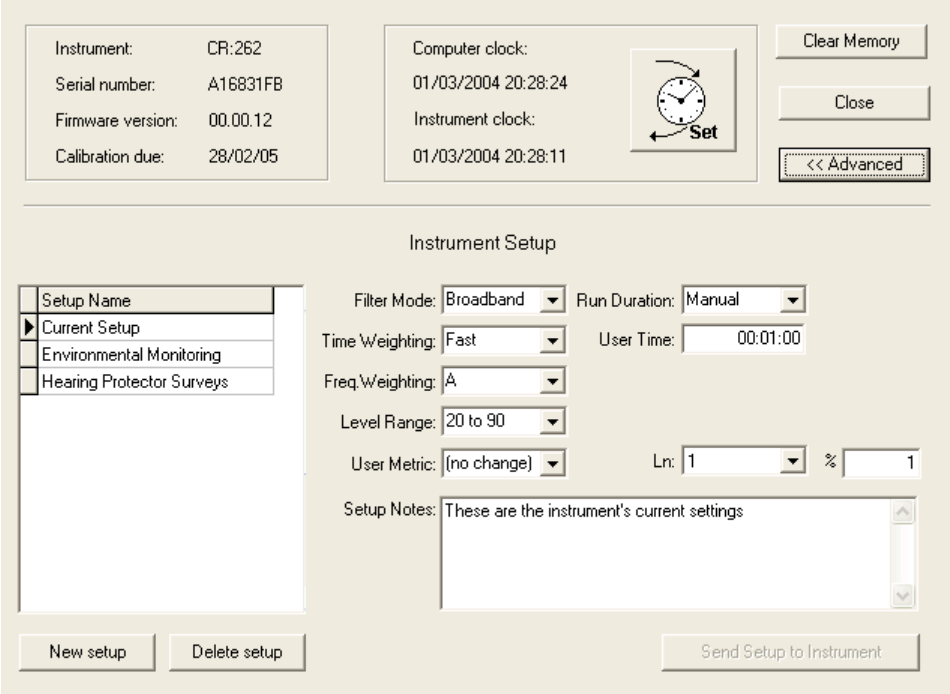


Please note that all measurements will be deleted from the instrument memory at this point. Ensure that all measurements have been downloaded before clearing the memory.

Configuring the instrument

Press the Advanced button from the Configure Instrument screen (above) to view the instrument configuration options.

The current configuration of the instrument will be displayed as shown in the example below.



To create a new configuration, press the New Setup button and change the settings to those required.

To program the instrument with the new settings, press the Send Setup to Instrument.

To delete a configuration from the software, press the Delete Setup button.

The user can select and alter the following parameters:

Function	Available Options
Filter Mode	Broadband Mode or 1:1 Octave Band Mode (CR:264A & CR:263A Only)
Run Duration	Manual, 1 minute, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 8 hours, 12 hours, User Defined
User Time	Enter a user defined measurement duration and select User Defined from the Run Duration list above
Time Weighting	dB(A), dB(C), dB(Z)
Frequency Weighting	Fast, Slow, Impulse
Level Range	10 to 80, 20 to 90, 30 to 100, 40 to 110, 50 to 120, 60 to 130, 70 to 140
User Metric	SEL (LAE) or LIeqt
Ln	Ln 1 to 6, Define the exceedence level for Ln's 1 to 6
Setup Notes	User notes for the measurement setup.

Section 5 Maintenance & Care

The CR:260A Series are precision measurement instruments and should be treated with care. Do not allow the instrument to be exposed to substances which may cause damage to the components of the unit. If the instrument is to be used in an environment where particles such as dust may come into contact with the instrument, always use a Windshield (UA:237) to protect the microphone capsule.

The instrument is not waterproof and should not be used in situations where moisture will form or condense on the microphone capsule or the instrument body. If using the instrument outdoors, use a suitable outdoor measurement kit which has been specifically designed to protect the instrument.

If the instrument becomes dusty, wipe it down with a cloth that is lightly dampened with water or a mild detergent. Do not use aromatic hydrocarbons, chlorinated solvents, or methanol-based fluids when wiping down the meter.

Do not clean the microphone capsule. Do not remove the microphone grill as this can cause severe damage to the membrane. Physical damage to the microphone capsule is not covered by the instrument warranty.

Section 6 Troubleshooting

This section contains information which may solve simple operational problems you may encounter. If you are unable to solve the problem or experience any problems with the assembly or operation of the instrument contact Cirrus Research plc or your local representative for further assistance

Basics

Symptom	Possible Cause	Possible Remedy
The instrument does not switch on	The batteries are not fitted	Fit new batteries and switch on
	The batteries are flat or very low	Fit new batteries and switch on
	The batteries are not correctly fitted	Remove the batteries and check the polarity of the batteries
	The instrument has become corrupted	Contact your local distributor or Cirrus Research plc

Calibration

Symptom	Possible Cause	Possible Remedy
The calibration fails: Too Low	The Acoustic Calibrator is not switched on	Switch on the Acoustic Calibrator and retry
	The Acoustic Calibrator is not fitted correctly	Check that the Acoustic Calibrator is fitted according to the instructions supplied.
	The Preamplifer is not fitted correctly. Class 1 Instruments only	For Class 1 Instruments, refer to page 17 for details of fitting the preamplifier.
	The microphone capsule is loose or not fitted	Check that the microphone capsule is tight and fitted correctly
	Calibration level set to a different level	Set the calibration level to the value provided by the Acoustic Calibrator.
	The Microphone may be damaged	Contact Cirrus Research plc or your local representative for assistance
The calibration fails: Too High	The Acoustic Calibrator is set to a higher level than the expected level	Set the Acoustic Calibrator to the correct level
The calibration fails: Unstable	The background noise level is within 15dB of the calibration level	Move to a location where the background noise level is more than 15dB below the calibration level
	The Microphone may be damaged	Contact Cirrus Research plc or your local representative for assistance

Measurements & Settings

Standard Instruments

Symptom	Possible Cause	Possible Remedy
No measurements have been stored	Only 1 measurement can be stored in the Standard instruments	
	The measurement was reset	Restart the measurement
Overload symbol is shown	The noise level is too high for the current range	Select a higher measurement range
Under Range symbol is shown	The noise level is too low for the current range	Select a lower measurement range.

+Version Instruments

Symptom	Possible Cause	Possible Remedy
No measurements have been stored	Memory is full.	Clear the memory using the Deaf Defier3 software.
	The measurement was reset	Restart the measurement
Instrument has selected Impulse Time weighting	L_{Ieqt} User Metric may have been selected	Select SEL User Metric and change Time Weighting required
Overload symbol is shown	The noise level is too high for the current range	Select a higher measurement range
Under Range symbol is shown	The noise level is too low for the current range	Select a lower measurement range.
The measurement stops after a set time	The Run Duration has been set to a preset value.	Select the Manual Run Duration
	The Run Duration has been set to the User Defined value.	Select the Manual Run Duration
The measurement does not stop as expected	The Run Duration has been set to Manual	Select a preset Run Duration

Downloading Measurements (+Version Only)

Symptom	Possible Cause	Possible Remedy
Measurements cannot be downloaded	No measurements have been stored	Repeat Measurement
	Instrument is not connected to PC	Connect the USB cable between the Sound Level Meter and the PC
	Batteries are too low	Replace batteries

Section 7 Glossary

1:1 Octave Band Filters	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
'A' Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
Acoustic Calibrator	An instrument that provides a reference noise source that is used to calibrate and check the performance of a Sound Level Meter.
Broadband	Noise Measurements using parameters which include all the audible noise, such as dB(A) and dB(C)
C Weighting	A standard weighting of the audible frequencies used for the measurement of Peak Sound Pressure level.
CE Marking	A label used to show that the Sound Level Meter conforms to the specification of a European Directive
dB(A)	Decibels A weighted
dB(C)	Decibels C Weighted
dB(Z)	Decibels Z weighted
Decibel (dB)	The units of sound level and noise exposure measurement
DIN 45641	German Standard which defines the additional measurements L_{AFTeq} & L_{IeqT}
Fast Time Weighting	A standard time weighting applied by the Sound Level Meter
IEC 60651:1979	The International Standard for Sound Level Meters
IEC 60804:1984	The International Standard for Integrating & Integrating-Averaging Sound Level Meters
IEC 61260:1995	The International Standard for 1:1 Octave & 1:3 Octave Band Filters
IEC 61672-1:2003	The International standard for Sound Level Meter and Integrating Averaging Sound Level Meters that replaces both IEC 60651 and IEC 60804
Impulse Time Weighting	A standard time weighting applied by the Sound Level Meter
Integrating Averaging Sound Level Meter	A Sound Level Meter which accumulates the total sound energy over a measurement period and calculates an average
$L_{A10.0}$	The noise level exceeded for 10% of the measurement period with 'A' frequency weighting calculated by statistical analysis
$L_{A90.0}$	The noise level exceeded for 90% of the measurement period with 'A' frequency weighting calculated by statistical analysis
L_{AE}	Sound Exposure Level (SEL) with 'A' frequency weighting
$L_{Aeq,t}$	Equivalent continuous sound pressure level. A measure of the average sound pressure level during a period of time, t, in dB with 'A' weighting.
L_{AF}	Sound level with 'A' Frequency weighting and Fast Time weighting
L_{AFmax}	The maximum Sound level with 'A' Frequency weighting and Fast Time weighting
L_{AFmin}	The minimum Sound level with 'A' Frequency weighting and Fast Time weighting

L_{AFTeq}	Takt maximal sound level as defined by DIN 45641
L_{AI}	Sound level with 'A' Frequency weighting and Impulse Time weighting
L_{AImax}	The maximum Sound level with 'A' Frequency weighting and Impulse Time weighting
L_{AImin}	The minimum Sound level with 'A' Frequency weighting and Impulse Time weighting
L_{AS}	Sound level with 'A' Frequency weighting and Slow Time weighting
L_{ASmax}	The maximum Sound level with 'A' Frequency weighting and Slow Time weighting
L_{ASmin}	The minimum Sound level with 'A' Frequency weighting and Slow Time weighting
L_{CE}	Sound Exposure Level (SEL) with 'C' frequency weighting
$L_{ceq,t}$	Equivalent continuous sound pressure level. A measure of the average sound pressure level during a period of time, t, in dB with 'C' weighting.
L_{CF}	Sound level with 'C' Frequency weighting and Fast Time weighting
L_{CFmax}	The maximum Sound level with 'C' Frequency weighting and Fast Time weighting
L_{CI}	Sound level with 'C' Frequency weighting and Impulse Time weighting
L_{CImax}	The maximum Sound level with 'C' Frequency weighting and Impulse Time weighting
L_{Cpeak}	Peak Sound pressure level with 'C' frequency weighting
L_{CS}	Sound level with 'C' Frequency weighting and Slow Time weighting
L_{CSmax}	The maximum Sound level with 'C' Frequency weighting and Slow Time weighting
$L_{EP,d}$	Daily personal noise exposure
L_{eq}	Equivalent continuous sound pressure level. A measure of the average sound pressure level during a period of time, t, in dB
L_{IeqT}	Impulse weighted $L_{eq,t}$ as defined by DIN 45641
L_{n}	Statistical analysis of noise levels. The n denotes the percentage exceedence.
L_{ZE}	Sound Exposure Level (SEL) with 'Z' frequency weighting
$L_{Zeq,t}$	Equivalent continuous sound pressure level. A measure of the average sound pressure level during a period of time, t, in dB with 'Z' weighting.
L_{ZF}	Sound level with 'Z' Frequency weighting and Fast Time weighting
L_{ZFmax}	The maximum Sound level with 'Z' Frequency weighting and Fast Time weighting
L_{ZI}	Sound level with 'Z' Frequency weighting and Impulse Time weighting
L_{ZImax}	The maximum Sound level with 'Z' Frequency weighting and Impulse Time weighting
L_{ZS}	Sound level with 'Z' Frequency weighting and Slow Time weighting

L_{ZSmax}	The maximum Sound level with 'Z' Frequency weighting and Slow Time weighting
Overload	The input to the Sound Level Meter is too high for the current measurement range. Change the range
Peak	The maximum value reached by the sound pressure at any instant during a measurement period (in dB usually with C frequency weighting)
SEL	Sound Exposure Level, displayed as L_{AE}, L_{CE} or L_{ZE}
Slow Time Weighting	A standard time weighting applied by the Sound Level Meter
Sound Level	Sound Pressure Level with a Frequency weighting, such as dB(A)
Sound Level Meter	An instrument for measuring various noise parameters
SPL	Sound Pressure Level, the basic measure of noise loudness, expressed in decibels
Statistical Analysis	A calculation performed by a Sound Level Meter on the noise levels measured during the measurement period to describe the statistical spread of the noise.
Time History	A sample of the noise levels taken every 1 second throughout the measurement period.
Class 1	Laboratory & Field Grade for Sound Level Meters
Class 2	General Field Grade for Sound Level Meter
Under Range	The input to the Sound Level Meter is too low for the current measurement range. Change the range
Z Weighting	Z weighting is a flat frequency response of 8Hz – 20kHz ±1,5dB excluding microphone response.

Appendix 1 Specifications

Instrument Versions

CR:261A Class 1
CR:262A Class 2

CR:263A Class 1 with 1:1 Octave Band Filters
CR:264A Class 2 with 1:1 Octave Band Filters

Applicable Standards

Sound Level Meter

IEC 61672-1:2002 Class 1 or 2 Group X
IEC 60651:1979 Type 1 I or Type 2 I
IEC 60804:1985 Type 1 or Type 2
ANSI S1.4 with NK:70 Random Incidence Adaptor Fitted

1:1 & 1:3 Octave Band Filters (where fitted) to IEC 61260 Class 1

Microphone

Class 1	Class+ Class 1 pre-polarized Free-field ½" Condenser
Class 2	Class+ Class 2 pre-polarized Free-field ½" Condenser Random Incidence to ANSI S1.4 with NK:70 Adaptor
Capacitance	18pF

Microphone Preamplifier

Class 1	MV:200D Removable Preamplifier
Class 2	MV:200D Integral Preamplifier

Microphone Extension cables (Class 1 Instruments only)

ZL:202 2m
ZL:205 5m
ZL:210 10m
ZL:215 15m
ZL:220 20m
ZL:225 25m

Time Weightings

'F' (Fast)	to IEC 61672-1:2002 Class 1 or 2 Group X

+Version also provides

'S' (Slow)	to IEC 61672-1:2002 Class 1 or 2 Group X
'I' (Impulse)	to IEC 61672-1:2002 Class 1 or 2 Group X

Frequency Weightings

Channel 1	'A' or 'C' User Selectable
Channel 2	'C' for Peak

+Version also provides

Channel 1	'A','C','Z'
Channel 2	'C' for Peak

Z weighting is a flat frequency response of 8Hz – 20kHz ±1.5dB excluding microphone response. When either 1:1 or 1:3 Octave Band filters are selected the 'Z' weighting is used.

Frequency Weightings can only be changed from the default values in the ***+Versions*** of the CR:260A Series. Contact your local representative for further information.

Amplitude Weighting

Q=3 (True Energy Integration)

Measurement Range

Broadband

24dB(A) to 140dB(A) Class 1
26dB(A) to 140dB(A) Class 2
143dB(C) Peak (70 to 140dB Range)

1:1 Octave Band Filters (CR:264A & CR:263A)

15dB(Z) to 140dB(Z)

Range Steps

10-80, 20-90, 30-100, 40-110, 50-120, 60-130, 70-140

Noise Floor (Typical)

Broadband

21dB(A) Class 1, 23dB(A) Class 2

1:1 Octave Band Filters

12dB(Z) @ 1kHz 1:1 Octave Band

Available Measurements

dB(A) Broadband Mode:

L_{AF} Sound Level (Not Stored), dB(A), Fast Time Weighting
L_{Aeq} Equivalent Continuous Sound Level, dB(A)
L_{AFmax} Maximum Sound Level, dB(A), Fast Time Weighting
L_{AFmin} Minimum Sound Level, dB(A), Fast Time Weighting
L_{Cpeak} Peak Sound Pressure, dB(C)
Measurement Duration

dB(C) Broadband Mode:

L_{CF} Sound Level (Not Stored), dB(C), Fast Time Weighting
L_{Ceq} Equivalent Continuous Sound Level, dB(C)
L_{CFmax} Maximum Sound Level, dB(C), Fast Time Weighting
L_{CFmin} Minimum Sound Level, dB(C), Fast Time Weighting
L_{Cpeak} Peak Sound Pressure, dB(C)
Measurement Duration

1:1 Octave Band Mode:

Selected Frequency
Filtered L_{ZF} (Not stored), dB(Z), Fast Time Weighting
Filtered L_{Zeq} Equivalent Sound Level
L_{Aeq}, L_{Ceq} & L_{Zeq} Equivalent Sound Level
Measurement Duration

+ Version also allows the following measurements to be made

Broadband Mode:
L_{XY} Sound Level (Not Stored)
L_{Xeq} Equivalent Continuous Sound Level
L_{XYmax} Maximum Sound Level
L_{XYmin} Minimum Sound Level
L_{Cpeak} Peak Sound Level
L_{XE}, L_{XIeq} or L_{XFTeq}
L_{Xn} (0.1 to 99.9) Five Simultaneous values
Date & Time of measurement
L_{Xeq} Short L_{eq} Time History
Where X= dB(A), dB(C) or dB(Z) Frequency Weighting.
Y = Fast(F), Slow(S) or Impulse(I) Time Weighting

1:1 Octave Band Mode:
Selected Frequency
Filtered L_{ZF} (Not stored), dB(Z), Fast Time Weighting
Filtered L_{Zeq} Equivalent Sound Level
L_{Aeq}, L_{Ceq} & L_{Zeq} Equivalent Sound Level
Measurement Duration
Date & Time of Measurement

Frequency Bands (Nominal Frequencies)

1:1 Octave Band

31Hz, 63Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz, 8kHz, 16kHz

Measurement Storage

The Last measurement is stored.

+ Version also provides
100 broadband or 1:1 Octave Band measurements
Calibration records are automatically stored
Short Leq Time History (L_{Aeq},L_{Ceq}, or L_{Zeq}).
Up to 24 hours at 1 second

Automatic Measurements (+*Version Only*)

The unit can be set to record and store data over fixed times of

1 minute	5 minutes
10 minutes	15 minutes
30 minutes	1 hour
8 hours	12 hours

or a user defined period
Automatic Repeat From 2 to 999 measurements (broadband mode only)
Auto-synchronise to the clock.

Display

Graphical LCD with Quasi-Analogue Display
Selected measurement parameter with level
Warnings for Overload, Under Range
Battery Level
Time & Frequency Weighting
Elapsed measurement time
Real time short L_{eq} (broadband mode)
Graphical 1:1 Octave Bands (CR:264A & CR:263A Only)
Recalled Last Measurements
Measurement Range
Instrument settings

Weight

450 gms

Dimensions

340mm x 75mm x 25mm

Batteries

2 x 1.5v Alkaline LR6/AA

Battery Life

Broadband	Typically >24 hours
Filter Mode	Typically >12 hours

Battery voltage is continuously monitored and warning is given on display of impending low battery condition. When batteries approach end of life the unit will store any data required and switch off automatically.

Environmental

Temperature

Operating	-10°C to +50°C
Storage	-20°C to +60°C

Humidity

Up to 95% RH Non Condensing

External Connections (+ Version Only)

Data Output	USB Type B Socket

Output Cables (+ Version Only)

Standard	ZL:100 USB Cable (supplied as standard)

Software Support (+ Version Only)

Deaf Defier3 for Windows. (Version v3.1.0 or later)
The Deaf Defier3 for Windows requires the following:
Microsoft Windows 98SE or later
6Mb of available hard-disk space for program files
CD-ROM Drive
SVGA Display
Microsoft compatible mouse or pointing device
USB Connection

Electromagnetic Performance

EN 55022:1994
EN 61000-4-2:1995
EN 61000-4-3:1996 80MHz - 1GHz
EN 61000-4-3:1996 25MHz - 80MHz
EN 50204:1995 900MHz
EN 61000-4-8:1994 50Hz

Appendix 2 Software Installation

The CR:260A Series are supplied with a CD which includes the Deaf Defier3 software on a CD.

This program allows measurements to be downloaded from the +Version of the CR:260A Sound Level Meter.

The Deaf Defier3 software also allows the CR:260A Series instruments to be unlocked using a unique key provided by Cirrus Research plc.

Deaf Defier3 is suitable for PC's running Microsoft Windows 95 or later, including WindowsXP, Windows2000 and Windows Vista. Deaf Defier3 is supplied on CD-ROM, with a full installation program, and comprehensive on line help, which gives details of the options and functions of the software, along with details of the calculations used in the Hearing Protector Selection Report.

Please also note that full administrator access may be required to install the Deaf Defier3 software under WindowsXP, Windows2000, WindowsNT or Windows Vista. Contact your system adminstrator for further details.

To install the software, insert the CD-ROM into a CD-ROM drive on the PC. The installation program should automatically start.

If the installation program does not automatically start run D:\setup.exe where D is the drive letter of the CD-ROM drive on the PC.

System Requirements

The Deaf Defier3 for Windows requires the following:

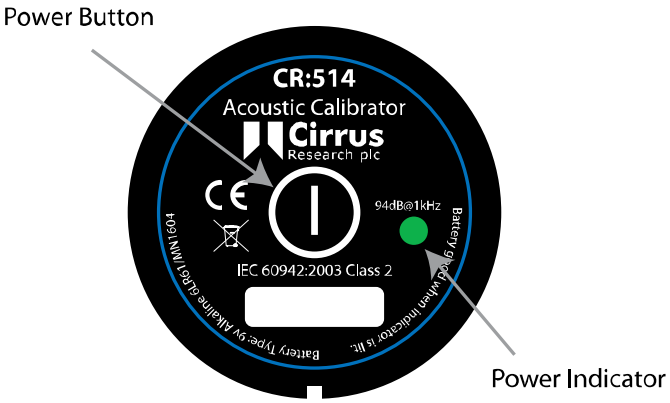
Windows 98 Second Edition, Windows ME, Windows NT Workstation 4.0 with service pack 6, Windows 2000 Professional with service pack 2, Windows XP Home Edition or Professional, Windows Vista
25Mb of available hard disk space for program files
64Mb RAM (128Mb recommended)
CD-ROM Drive for Installation
VGA or higher resolution monitor, Super VGA Recommended
Microsoft compatible mouse or pointing device
USB Port

Appendix 3 Acoustic Calibrators

Operation.

Switching on the Calibrator

Press the Power Button on the end of the Calibrator to switch the unit on. The Indicator will illuminate to show that the unit is operating.



The calibrator will automatically switch off after 5 minutes to preserve battery power.

To switch off the calibrator manually, press the power button again and the indicator will extinguish to show that the unit is switched off.

Permanent-on Mode

For some applications there may be a need to have the calibrator switched on continuously. To allow for this, the calibrator can be turned on by pressing and holding the power button for three seconds.

Release the button and the indicator will flash to show that the unit is in permanent-on mode. Press the power button to switch off the calibrator.

Calibrating a Sound Level Meter.

Push the microphone of the Sound Level Meter into the cavity at the end of the calibrator. Ensure the microphone is fully inserted into the cavity and is past the 'O' ring seals. The microphone should be parallel to the body of the calibrator. Also ensure that the small bleed-hole next to the microphone cavity is not blocked as this could cause damage to the microphone.

Most modern Sound Level Meters have electronic calibration with the level adjusted automatically. Adjust the Sound Level Meter to the correct level where applicable. When correcting the value generated by the calibrator a correction for the Class of microphone capsule may need to be applied (see Appendix 2)

Background Noise

In order for the calibrator to operate as intended, the ambient acoustic noise level should be no greater than 80dBA.

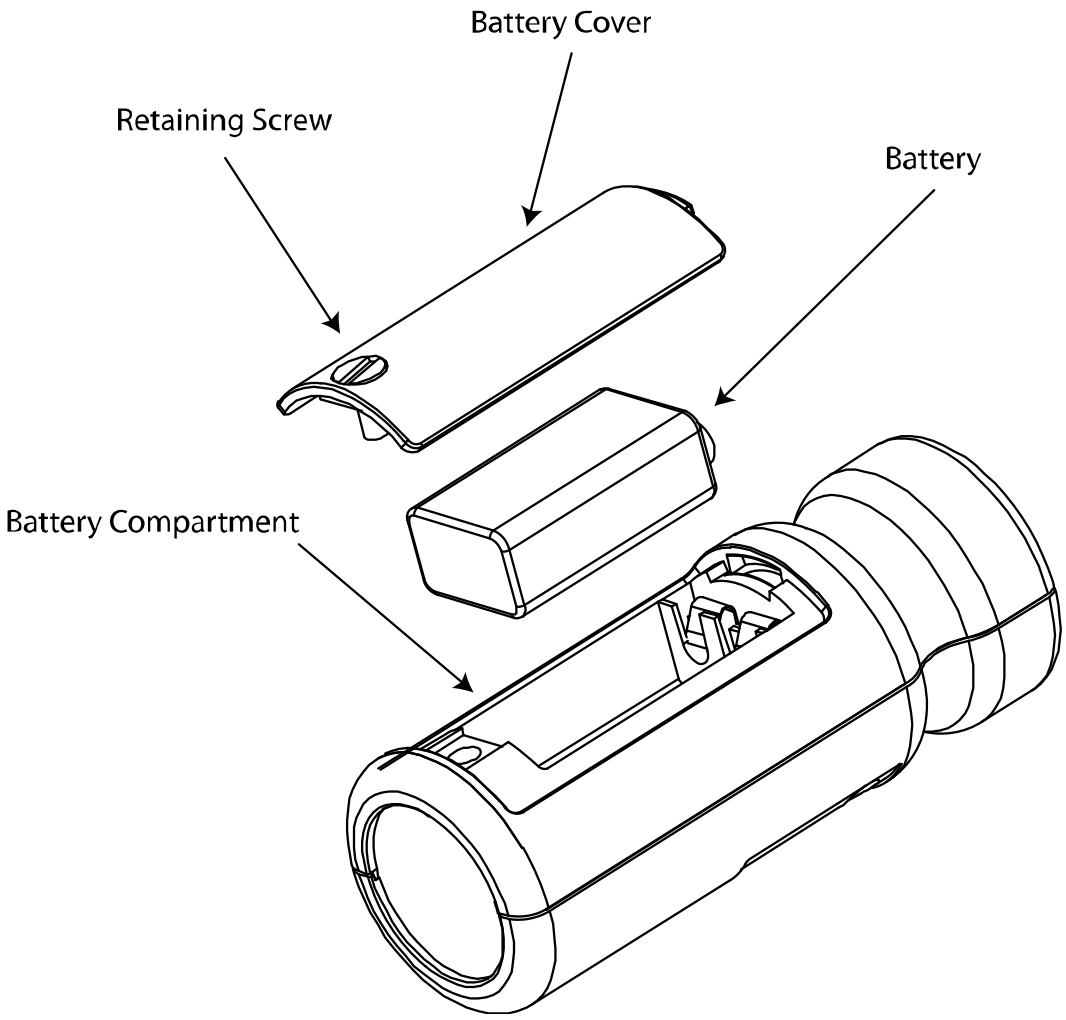
Stabilisation

In order for the sound pressure level and frequency to stabilise after switching the calibrator on when coupled to a microphone, a period of at least 3 seconds should be allowed before performing a calibration.

Changing the Battery

The CR:514 & CR:515 acoustic calibrators use a single 9v alkaline battery. This Class of battery is known as 6F22 or NEDA 1604. It is also commonly known as PP3.

1. Unscrew the screw holding the battery cover on, using a coin or the keyring supplied
2. The battery, Class 6F22 (PP3) can now be eased out of its holder and replaced. The battery should be eased out terminal side first by pushing against the spring at the other end. Ensure that the battery is inserted with the correct polarity with the negative terminal at the contact with the larger cutout.



Battery Class.

The battery should be an alkaline battery, not an ordinary dry cell. The battery is 9 volts when new and will operate the calibrator down to 6.4 volts. When the battery voltage is below 6.6 volts but above 6.4 volts, the power LED will flash to indicate that the battery voltage is low. When the battery voltage is below 6.4 volts the calibrator will not turn on. A discharged battery may allow switch-on but will soon drop in voltage and indicate low battery or switch off.

Specification.

Frequency	1kHz ± 1%
Sound Level	94dB re 20µPa
Standardisation	CR:514 - IEC 60942:2003 Class 2 CR:515 - IEC 60942:2003 Class 1
Distortion	Less than 2%
Operating Humidity	25 to 90% Relative Humidity
Operating Static Pressure	65 kPa to 108kPa
Operating Temperature	-10°C to +50°C
Storing Temperature	-20°C to +60°C
Effective Volume	6.19 cm^3 ± 0.2 cm^3
Cavity Diameter	0.525 inch
Battery	1 x 9v 6F22 (Neda 1604)
Battery Life	Approx 15 Hours Continuous Use
Battery Voltage	9v Nominal (10v Maximum, 6.4v Minimum)
Weight with Battery	185g
Dimensions	135mm x Ø48mm

Technical Information

The normal mode of operation of the calibrator is with the unit switched on.

When the LED indicates the unit is switched on this produces the greatest radio frequency emissions.

The calibrator continues to function after exposure to contact discharges up to 4kV and air discharges up to 8kV, for both positive and negative voltages relative to earth ground.

The calibrator conforms to IEC 60942:2003 for a modulated root-mean-square electromagnetic field strength of 10 V/m.

The maximum susceptibility to power and radio frequency fields is with the cavity facing away from the emitter with the battery compartment facing the table, the antenna polarisation horizontal and the calibrator switched on.

Free Field Correction

When calibrating a microphone which is to be used for free field measurements, a small correction may be necessary to compensate for the difference between the microphone's free field response at 'zero degrees' or 'head-on' incidence and the pressure level generated by the calibrator.

The correction is typically -0.3dB for ½ inch microphones (making the effective calibration level 93.7dB).

The table below shows the correction values for the standard microphones of Cirrus Research plc.

Calibration corrections are listed below for the Cirrus Research plc ½" Capsules and three microphone capsules commonly used in Calibration Laboratories:

Microphone Correction Values

Microphone Class	Calibration Correction	Effective Calibration Level
MK:202	-0.3dB	93.7 dB
MK:215	-0.3dB	93.7 dB
MK:216	-0.3dB	93.7 dB
MK:226	-0.3dB	93.7 dB
MK:224	-0.3dB	93.7 dB
B&K 4134	0dB	94.0 dB
B&K 4180	0dB	94.0 dB
B&K 4192	0dB	94.0 dB

Example

An example of the procedure used to calculate the value for an MK:224 microphone is shown below :

Level = 94.0dB + Microphone Correction

Level = 94.0dB + (-0.3dB)

Level = 93.7dB

Different microphones will have different correction values. Please check the operation manual for the Sound Level Meter or microphone concerned for details.

Appendix 4 - CE Declaration of Conformity

Cirrus Research plc Hunmanby UK
CE Certificate of Conformity

CE

Manufacturer: Cirrus Research plc
Acoustic House, Bridlington Road
Hunmanby, North Yorkshire, YO14 0PH
United Kingdom
Telephone +44 1723 891655

Equipment Description

The following equipment manufactured after 1st January 2008:

CR:261A Sound Level Meter
CR:262A Sound Level Meter
CR:263A Sound Level Meter
CR:264A Sound Level Meter
CR:514 Acoustic Calibrator
CR:515 Acoustic Calibrator

Along with their standard accessories

According to EMC Directives 89/336/EEC and 93/98/EEC

meet the following standards

EN 61000-6-3 (2001)

EMC : Generic emission standard for residential, commercial and light industrial environments.

EN 61000-6-1 (2001)

EMC : Generic immunity standard for residential, commercial and light industrial environments.

Signed Dated 1st January 2008

S. O'Rourke
Director

Warranty Information.

1. This document is a summary of the full warranty document and explains the Cirrus Research plc warranty in ordinary English; not in legal or complex terms.
2. The warranty covers any acoustic instrument such as a sound level meter, acoustic calibrator, real time acoustic analyser or personal sound exposure meter (dosemeter) manufactured by Cirrus Research plc after September 1st 2011.
3. The warranty covers all faults on, and minor accidental damage to, the instrument except the microphone capsule for the period defined in para (5) below.
4. Minor accidental damage does not include blatant miss-use, damage caused by the use of any accessories or components not specified or recommended by Cirrus, damage caused through non-Cirrus modification, continued use outside of Cirrus' recommended procedure or conditions or use contrary to the any advice provided by Cirrus.
5. The initial period of the warranty is 2 (two) years or 104 weeks from the date of purchase as a new instrument from Cirrus Research plc or their formally approved distributors OR 130 weeks from the date the instrument passed its final manufacturing inspection at Cirrus Research plc - whichever is the shorter.
6. A shorter 1 (one) year or 52 week warranty is offered for used, ex-demo or ex-rental equipment unless a special arrangement is made and a written confirmation of the special warranty is given by Cirrus Research plc.
7. Any rechargeable battery only has the battery manufacturer's one year warranty, however there will be a reduced charge for their replacement during the annual "Traceable Calibration."
8. On completion of the annual "Traceable Calibration" by Cirrus Research plc, or an official Cirrus Calibration Centre, the instrument will automatically be given an additional free one year warranty.
9. It follows that should the instrument be calibrated by Cirrus Research plc, or an official Cirrus Calibration Centre every year, the warranty is effectively continuous to a maximum of 15 (fifteen) years from the date of purchase.
10. There will be a charge for this "Traceable Calibration" and the price is published in the Calibration Price List. The customer is responsible for all shipping, duty and other charges relating to the annual "Traceable Calibration".
11. Where a repair service is conducted under warranty, Cirrus Research plc will cover the shipping, duty and other costs relating to the repair of the instrument.
12. Cirrus Research endeavors to ensure stocks of instrument components for the full fifteen year period but do not guarantee to do so as certain components do become obsolete or discontinued.
13. If a sub-component becomes obsolete and stocks are depleted then Cirrus Research will endeavor to facilitate a repair but will not offer the same length warranty.
14. In the event of any dispute on the terms of the warranty Cirrus Research plc will accept pendulum arbitration by the United Kingdom Institute of Acoustics Ltd.
15. The warranty does not in any way reduce any legal right of the buyer or user of the sound level meter; it is in addition to all legal rights determined by the European Union.
16. Cirrus Research plc reserves the right to amend or update these terms and conditions without prior notice.

Warranty Terms 2.5 May 2012

Cirrus Research Offices

The addresses given below are the Cirrus Research plc offices. Cirrus Research plc also have approved distributors and agents is many countries worldwide. For details of your local representative, please contact Cirrus Research plc at the address below. Contact details for Cirrus Research authorised distributors and agents are also available from the Internet Web site at the address shown below.

Main Office

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
United Kingdom
YO14 0PH

Telephone: +44 (0)1723 891655
Fax: +44 (0)1723 891742
E-mail: sales@cirrusresearch.co.uk
Web Site: www.cirrusresearch.co.uk

Germany
Cirrus Research plc Deutschland
Arabella Center
Lyoner Strasse 44 – 48
D-60528 Frankfurt
Germany

Tel: +49 (0)69 95932047
Fax +49 (0)69 95932049

Email: vertrieb@cirrusresearch.de
Web: www.cirrusresearch.de

Spain
CIRRUS RESEARCH S.L.
Travessera de Gracia, 62 4° 7ª
08006 Barcelona
SPAIN

Tel: (34) 933 622 891
Email: info@cirrusresearch.es
Web: www.cirrusresearch.es